

mediate vicinity of Dubuque. A rise of more than 4 feet occurred at Dubuque, in approximately 28 hours, after which the river started to recede fairly rapidly. Damage near Dubuque, and elsewhere along the Mississippi, was slight, except for losses suffered by the railroads.

Ohio River basin.—The following report is submitted by the official in charge, Weather Bureau Office, Parkersburg, W. Va., relative to the disastrous flash flood in the upper Little Kanawha River basin:

The most disastrous flash flood in the history of central West Virginia occurred during the night of August 4-5, 1943, causing the deaths of 23 persons and property damage estimated at near \$1,300,000. The damage was confined to an area approximately 48 miles long, extending from just west of Big Island Run to the upper reaches of Salt Lick Creek, with the maximum width about 12 miles.

Thundershowers, mostly of short duration, occurred about dusk on August 4, throughout the Little Kanawha River Basin. However, these showers were locally heavy in the Burnsville-Copen area. They were followed about 3 hours later by record-breaking rains accompanied by one of the worst, if not the worst, electrical storms of record. The excessive rains began to fall in the McFarlan-Girta area about 11 p. m., August 4, and progressed southeastward into the Salt Lick Creek Basin where the excessive rains began about 1 a. m., August 5. These rains continued in most places for from 1 to 2 hours and were generally continuous, although quite a number of persons reported brief slackenings of the hard rains. There were two main peaks of excessive rainfall, one over the Burnsville-Copen-Cedarville area and the other over the Nobe-Brohard area.

A crest stage of 30.7 feet was reached at Glenville at 6:30 p. m., of the 5th, while the crest stage at Creston was 19.7 feet at 9 a. m., of the 6th. The Creston crest was 0.3 foot below flood stage. The anomalous situation of a crest 2.3 feet below the record at Glenville, while Burnsville, 18 miles upstream had a crest 10 inches higher than the previous record, was due to the fact that approximately two-thirds of the Glenville drainage area comprises sections where the intensity of the rainfall sloughed off sharply. Except for the high-water mark at Burnsville, gage heights on the main stream do not tell the story of this flood; neither do the amounts of rainfall recorded at the river and the cooperative stations maintained in the basin, except that the record at McFarlan, just north of the downstream peak of maximum rainfall indicated a fall of 3.70 inches in 1 hour. The findings of a survey of the rainfall catch in regions where there are no official gages will be reported in a later issue of the REVIEW.

Generally speaking, the southern tributaries of the Little Kanawha River starting with Long Run and ending with the left Fork of Steer Creek were the highest of record, while from Third Run to and including Yellow Creek, the northern tributaries crested higher than ever before. On the South Fork of the Hughes River, the tributaries from Spruce Creek to Big Island Run were also as high or higher than the previous records.

The damage to the land was tremendous. Practically every hill in the flood area was scarred by one or more blow-outs or slides. Every cove showed excessive washes. The scour and fill in the valleys was great for, in addition to the usual gravel fill, sizeable rocks and some boulders were washed from the hill tops down into the valleys. Instead of the usual gully drainage, observers reported that the run-off was in sheet-form with waves forming in some instances. The run-off was rapid in the creeks, as all of them crested at or shortly after the cessation of the excessive rainfall.

The South Fork of the Hughes River ran out rapidly. The body of one of the victims of Big Island Run floated downstream into the South Fork, then into the Little Kanawha River and then into the Ohio River and was recovered near Harris Ferry, W. Va., at 6 p. m., August 5, shortly before the main stream crested at Glenville. The body floated 49 miles in 16 hours. The run-out of the Little Kanawha River at Parkersburg was very swift for the 2 days (5th and 6th), as the Ohio River was in pool above Parkersburg and the navigation dams below Parkersburg had been lowered in anticipation of this run-off.

Twenty-three persons were drowned: 8 in the vicinity of Heaters on O'Brien Fork of Salt Lick Creek, 8 in the vicinity of Copen on Copen Creek, 5 at Girta on Big Island Run, and 2 above Tanner on Tanner Creek.

Property damage has been estimated at near \$1,300,000, about half of which was to crops and farms. On the 10 miles of track of the Baltimore & Ohio Railroad between Heaters and Burnsville several bridges washed out, much of the track was washed out or moved considerable distances and the roadbed damaged generally. Highways were damaged by slides, fills, and wash-outs and many

bridges were destroyed. In many instances streams moved over into the highways and will have to be rechanneled. All bottom land crops were destroyed and damage to home gardens was considerable. Much tillable land is now covered with rubble. Many houses, stores, schools, and churches were washed away; while others were moved some distance from their foundations. Considerable livestock and poultry were drowned. Extensive damage was done to fences and farm implements. Well-water supply was contaminated by overflow of streams or surface drainage. The small community of White Pine was practically wiped out. Burnsville was the only sizeable community to be damaged by the flood. Glenville's damage was much less, with the monetary loss due principally to loss of business and to expense of cleaning up.

Light to moderate overflows occurred in portions of the Scioto and Wabash Rivers between August 4 and 7 following rains ranging from 2 to 4 inches over portions of the basins on August 3-4.

Colorado River and Great Basin drainage.—The following report of flash floods in Utah is submitted by the official in charge, Weather Bureau Office, Salt Lake City, Utah:

One of the most devastating floods in the history of that area struck near the town of Helper, Utah, on August 5, causing \$20,000 damage to homes and other property, and an estimated \$50,000 damage to mine property, highways, railroads, and equipment in Spring Canyon north of the town, the most important coal mining district in the State.

Caused by an afternoon cloudburst which poured water into Spring Canyon for 35 minutes, the flood swept down the Price River, carrying haystacks, furniture, portions of houses, mine cars, and automobiles. Coal mining operations in some of the mines were suspended as long as 4 days. At least 20 homes were hit by the flood, and more than a dozen automobiles were carried into the river and badly damaged as flood waters poured through garages in which miners had parked their cars.

Another cloudburst on the same day caused damage estimated at \$120,000 to the town of Monroe, Utah. The municipal power plant was badly damaged by flood waters from Monroe Canyon, leaving the city without power and light for several days. The water system was disrupted, many homes were damaged by mudflows and water, and there was great damage to crops, particularly potatoes and beets. Some farm land is completely lost, according to reports.

FLOOD-STAGE REPORT FOR AUGUST 1943

[All dates in August unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
HUDSON BAY DRAINAGE					
Lake Erie	Feet			Feet	
St. Marys: Decatur, Ind.....	13	5	5	13.0	5
ATLANTIC SLOPE DRAINAGE					
Waccamaw: Conway, S. C.....	7	{ 22 30	27 (1)	7.3 7.3	24-25 30
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Skunk:					
Coppock, Iowa.....	12	3	13	21.6	4
Augusta, Iowa.....	15	4	8	20.3	6
Raccoon: Van Meter, Iowa.....	13	15	17	14.7	16
Mississippi:					
Hannibal, Mo.....	13	8	8	13.1	8
Louisiana, Mo.....	12	{ 9 17	9 18	12.2 12.2	9 17-18
Missouri Basin					
Grand: Chillicothe, Mo.....	18	5	5	18.0	5
Ohio Basin					
Little Kanawha: Glenville, W. Va....	23	5	6	30.7	5
Scioto: Circleville, Ohio.....	14	6	7	15.0	6
West Fork of White: Anderson, Ind....	10	4	6	12.5	6
Wabash:					
Wabash, Ind.....	12	4	6	17.8	4
Lafayette, Ind.....	11	5	7	13.5	6

¹ Continued into September.

² Due to manipulation of dam 24.